2010 Military Health System Conference

Using Lean Six Sigma to Meet Customer Needs

How LSS Improves Patient Care and Reduces Costs

Sharing Knowledge: Achieving Breakthrough Performance

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It is possible for our society to reduce the cost of health and medical care by 50 percent and simultaneously improve the outcomes for individual human beings.

Paul O'Neill, former U.S. Treasury Secretary
Former CEO, Pittsburgh Regional Healthcare Initiative
Former CEO, Alcoa

Agenda

- Lean Six Sigma Overview
- Role of the Voice of the Customer in Lean Six Sigma
- Application of the Methodology to Satisfy the Customer
- Utility of Lean Six Sigma for Medicine
- Practical Medical Applications with Results

Deming to Japanese

1. Any product or service organization must view itself as an integrated system
2. Unless all departments and individuals commit to a shared unifying purpose or aim, there can be no system
3. Delighting a customer is the only purpose that can unify an organization

Deming to Japanese

4. Such an organization must include customers & suppliers in the system
5. Decisions or changes must be based on data and
6. Continuously improve each product, service and person in the organization

Strategic Alignment

- The project definition requires a linkage to how this project aligns to the organizational strategy.
  - ✓ Refer to your organization's Strategic Plan and/or other referenced documents
  - ✓ Include the organizational metric / metrics that your project will help improve

Continuous Improvement

- A framework for constantly improving organizational performance
- Provides steady, incremental improvement in everything we do to meet/exceed changing expectations:
  - Better quality
  - Faster turnaround
  - Lower costs
  - More responsive service
  - A relentless, never-ending process

Foundation to Lean 6 Sigma

"To measure is to know.“

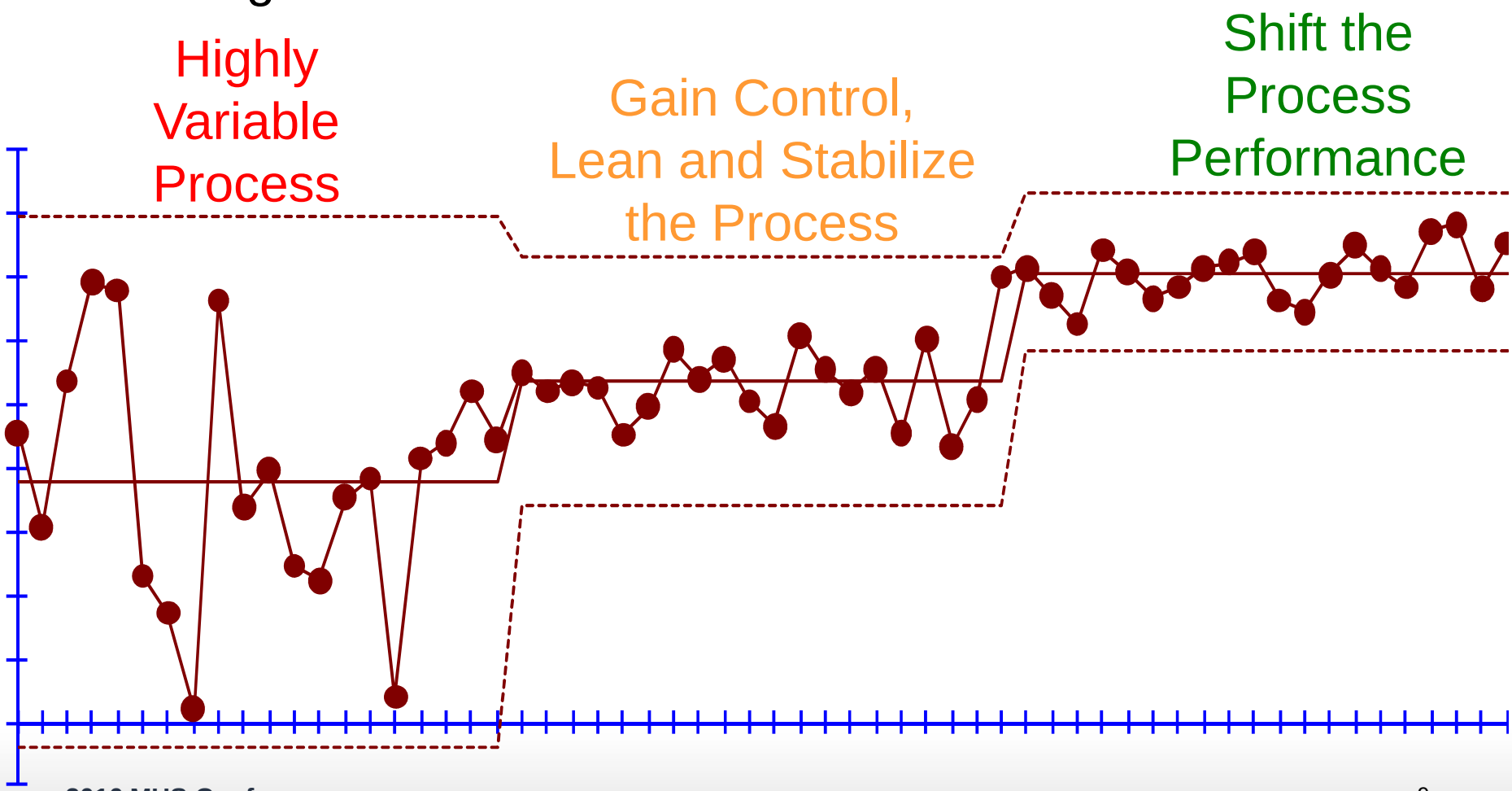
"If you can not measure it, you can not improve it.“

"…I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind…”

-Lord Kelvin

A Performance Improvement Program

- Performance Improvement includes a deliberate change in Process **Performance**

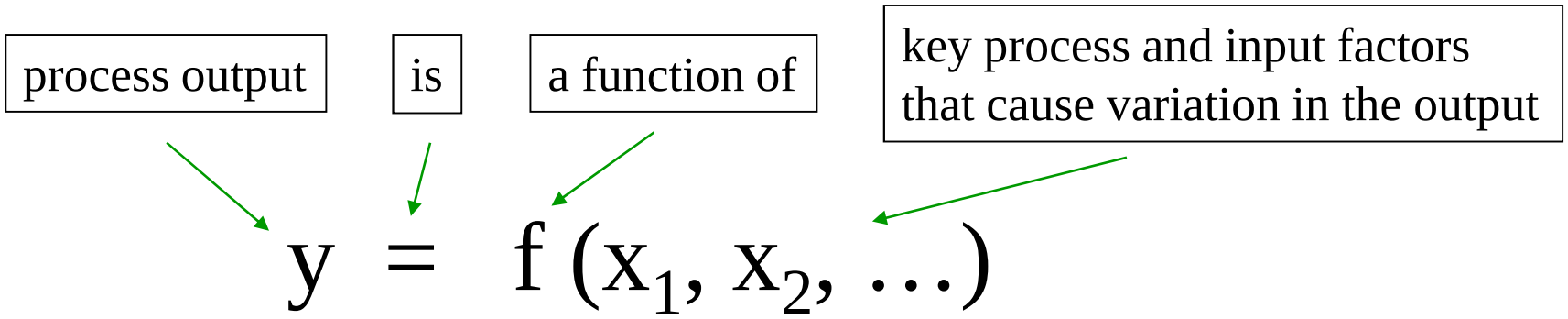


Foundation to 6 Sigma

$$Y = f(x)$$

Y is:	Xs are:
Output	Inputs
Dependent	Independent
Observed	Controlled
Effect	Causes
Result	Reason

Identify & Control the Xs



- In Improvement…
  - identify the key Xs to reduce variation in the Y
- In Design…
  - carefully set specifications on the Xs so that we get the desired Y
- In Process Management…
  - monitor and control the Xs to assure we will get the desired Y

Why Aim as High as 6 Sigma?

Even at 99% quality (equivalent to a sigma level of 3.8), there would be:

- At least 200,000 wrong drug prescriptions per year
- Unsafe drinking water almost 10 hours each month

- Two short or long landings at O'Hare airport each day

- Over 90,000 wrong felony convictions per year

- 20,000 lost or incorrectly delivered articles of mail per hour

The Look of 6σ Performance

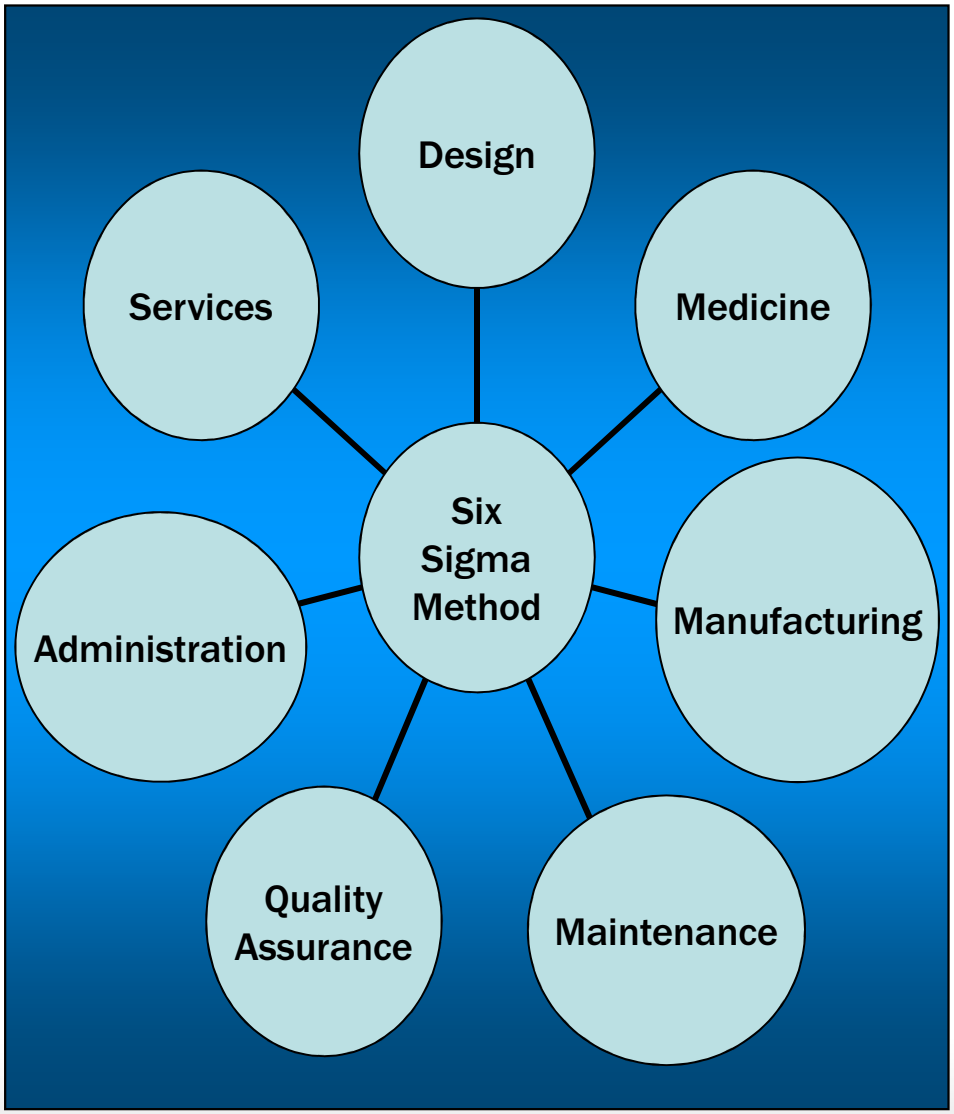
	99% Good	99.99966% Good
 Lost articles of mail per hour	20,000	7
 Incorrect surgeries per wk	5,000	1.7
 Wrong prescriptions each yr	200,000	68
 Hours without electricity	7 hr per month	1 hr per 34 years

Versatility

Applicable to EVERY Business Function

- Manufacturing
- Services

Any process that produces an output has downstream "customers" (external or internal)



Lean Six Sigma Principles

- Identify value in the eyes of the Customer
  - Learn to see your processes from the perspective of your customer
- Identify the value stream and eliminate waste/variation
- Make value flow at the pull of the customer
- Involve, align, and empower employees
  - Develop solutions using the people who are currently working in the process
- Continuously improve knowledge in pursuit of perfection

How We Do It

- Narrow customer demand to measurable activity
- Does the activity meet requirement as is? No
- Process capability analysis
- Root cause analysis/assessment – Why not?
- Hypothesis test root cause
- Analysis drives improvement
- Reassess requirement after improvement

System: Health care

Lean Six Sigma

- Customer
- Repeatable process
- Waste
- Root cause analysis
- 6 Sigma

Medicine

- Patient
- Work of doctors, nurses and health care practitioners
- Non-value added steps in the process
- 5 Why's?
- Zero medication errors, zero hospital-acquired infections, perfect clinical results

The Nun and the Bureaucrat

- Sister Mary Jean Ryan, CEO, SSM Health Care, St. Louis, MO
  - 20 acute care hospitals in four states
  - 2002 Malcolm Baldrige National Quality Award winner
- Hon Paul O'Neill, former CEO, Pittsburgh Regional Healthcare Initiative (PRHI)
  - Regional consortium of medical, business and civic leaders

“All wash hands” policy

- “All wash hands” policy was observed and recorded
- 32% of the physicians washed their hands before examining a patient
- 68% did not

Prescriptions

- A Ph.D pharmacist filled 250 prescriptions a day

  …all but 2 require a follow up telephone call with a MD for clarification of physician's intent
- Error not in miss-prescribed meds – error in 248 phone calls
- Rework = Waste

5 Whys? Medical carts dead

1. Dead batteries – why?
2. No power – why?
3. Dead outlet – why?
4. Splashing water from adjacent sink – why?
5. High water pressure – why?

- Solution: Plumber turns water pressure down which solves the problem and stays fixed

Key to access required materials

- Nurses spend time waiting for a key to access required materials
- The collective wait time amounted to 11 nurse days per year
- The solution was distributing keys on wrist bands at the start of a shift and collecting them at the conclusion of the shift

Wheelchair availability

- Problem: Staff hid wheelchairs for personal use in bathrooms and closets. They were dirty and in short supply.
- Solution: Retrieved, cleaned and sanitized; made available in a central location and marked with a telephone number of a staffer who would retrieve it upon request, clean it and return it to the central location.

Cardiac bypass surgery

- A cardiac surgeon may see 200 patients a year - a hospital consortium 6,000 a year
- Mortality = 2.3%
- 25% reduction possible by doing four things
  - Aspirin prior to surgery - 3 cents
  - Use of Beta Adrenergic Agents - 50 cents
  - Use of Intern Mammary Artery – no cost
  - Measurements of blood hematocrit during the operation – sunk

Cardiac bypass surgery - Returns

- 17% return rate following discharge
  - Data suggested post-discharge issue
- Perfect patient discharge checklist
- Estimated $1.7M saved
- Fewer deaths as coronary bypass readmissions declined 4.7%

Central line (catheter) infections

- Half of PRHI central line infections were fatal
- Survivors cost $30K to treat
- 63% reduction in central line infections since 2001
- Central line infections were eliminated in 3 months at Allegheny General by nurses who used data to determine root cause and prompted physician behavior using a checklist

Significant medical error rate

- Significant medical error rate reduced from .16 per 1000 to .01 per 1000 by continuous process improvement
- Based on a 7M nation-wide admissions figure, the potential outcome is a reduction from 1120 to 70 patients impacted

Nosocomial infections

- Hospital acquired infections
- 1 in 14 admissions succumbs to Nosocomial infections
- 1 dies every six minutes
- Costs $30k to $90k each
- 85% reduction in hospital acquired infections
  - SSM
  - PRHI

Nosocomial infections

- Nationally
  - 2M infected annually
  - 87,600 estimated to die
- By eliminating errors and Nosocomial infections
  - Save $7B annually or
  - ***2X all malpractice awards in the country!***
- Eliminate medical errors, you eliminate the evidence for malpractice

More Success Stories

- St. Joseph's Hospital changed the ER patient flow, allowing the hospital to treat at least 10,000 more patients annually.

- H. Lee Moffitt Cancer Center and Research Institute is expected to increase procedural volume by 12%, which will add nearly $8 million annually in incremental margin. – *Tampa Bay Business Journal*

More Success Stories

- A large metropolitan hospital system reduced inpatient transfers by 75% and has $2 million annual cost savings. – *iSixSigma.com*

- A top-five hospital system used Lean Six Sigma to redesign its transplant unit and as a result improved patient satisfaction by 50% within three months; the cost of care was reduced by 15%. – *Quality Digest*

More Success Stories

- St. Vincent Indianapolis Hospital made a 78% cut in the number of steps emergency department nurses take to get supplies. - *USA Today*
- A major hospital in the United States was able to reduce inpatient mortality rates by 47.8%. – *iSixSigma.com*
- North Mississippi Medical Center reduced the number of prescription errors in discharge documents by 50%. – *ASQ.org* (*American Society for Quality*)

More Success Stories

- The Mayo Clinic's Rochester Transplant Center reduced the cycle time from when a new patient made initial contact to setting up an appointment from 45 days to 3 days. – *iSixSigma.com*
- Mercy Medical Center decreased in-hospital mortality rates from 6.7% to 3.5%, a 47.8% reduction. – *Medical News Today*

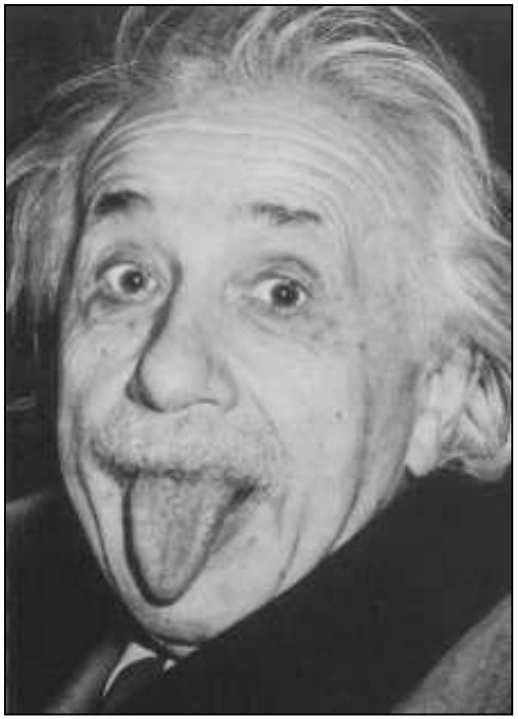
Foundation to Lean 6 Sigma

Definitions of Insanity:

Doing the same thing over and over and expecting a different outcome!

AND

Using the same logic to get out of the trouble that got you there in the first place!



-Albert Einstein

THANK YOU!

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